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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/696,013	10/26/2000	Hiroshi Yoshida	P107400-00016	2916

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EXAMINER
KOSLOW, CAROL M

ART UNIT	PAPER NUMBER
1755	2

DATE MAILED: 01/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/696,013	YOSHIDA ET AL.	
	Examiner	Art Unit	
	C. Melissa Koslow	1755	

-- The MAILING DATE of this communicati n appears on the c ver sheet with the correspondence address --

Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 October 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

The drawings, filed 26 October 2000, are approved under 37 CFR 1.84. Applicants are reminded of the changes to 37 CFR 1.84 and that the Draftsman no longer needs to approve the drawings. (See 65 Fed. Reg. 54603, 9/8/00).

The drawings are objected to because in Figure 5, "hole" is misspelled as "hall". A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The disclosure is objected to because of the following informalities:
On page 5, line 5, "mellatic" is misspelled. On page 13, line 22, the non-existent word "elementlic" appears. It is unclear what the correct word should be. On page 6 the description of section 3 is confusing since it teaches the added element can be at least one of section 2, but section 2 requires a minimum of two elements. On page 15, lines 1-4 teaches crystal mixing more than two type of transition elements, but the examples in lines 5-15 teach using two transition elements. Thus it is unclear which teaching is correct, that more than two transition elements are required, or that at least two transition elements are required. Applicants state the properties of the ZnO-type compound can be varied by varying the densities of the added elements, but it is unclear what is meant by this phrase or how the density of the added elements is varied. It is noted that pages 13 and 14 appear to indicate that the "density" referred to in this phrase is actually the amount of the added elements. Applicants need to clarify this issue. Finally, it is unclear how the energy is decrease and the sign and size of the magnetic interaction between metallic elements is controlled by the addition of at least two elements selected from Ti, Mn, Cu, V, Cr, Fe, Co, Ni, Rh or Ru. Appropriate correction is required.

Claims 3, 4 and 6 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

There is no support in the specification for the compounds of claims 2 and 3. Nowhere in the specification does it teach adding a combination of at least one element selected from V, Cr, Fe, Co, Ni, Rh or Ru and at least one of a n-type dopant or a p-type dopant. The specification clearly distinguishes between the two types of additions on pages 6, 7, 11, 15 and 16.

Claims 2 and 4-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 is indefinite since it is unclear as to minimum number of added metals required by this claim, two or three. Section 3 of claims 4 and 6 is indefinite since it teaches the added element can be at least one of section 2, but section 2 requires a minimum of two elements. In addition this section is confusing since it is unclear as to minimum number of added metals required by this claim, two or three, when using both section 1 and section 2. Claim 5 is indefinite since it does not positively set forth the claimed property. In addition, the term "desired characteristics" is indefinite since these characteristics of are not defined in the claim or in the specification. It is suggested to rewrite this claim as "The ferromagnetic ZnO-type compound of claim 4 having light-filtering characteristics." or to rewrite this claim using similar language. Claims 6 and 7 are indefinite as to the how the densities of the additives are adjusted. Claim 7 is indefinite since it is unclear if the method of adjusting the density of the additives is

limited to the densities of elements in section 2 or to all the listed elements. Claims 8-10 are indefinite as written since they imply the last steps of decrease or controlling are separate form the crystal-mixing step and there is no teaching as to how these steps are performed. From the specification, it appears these last steps are not method steps, as claimed, but the inherent results from the addition of the elements. These claims should be reworded to reflect this.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 4-7 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-14 of copending Application No. 09/806,373. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claimed compound and method of Application No. 09/806,373 suggest the compound and method of the present application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Application No. 09/806,373 claims a ZnO-type compound of ZnO doped with a p-type dopant and at least one n-type dopant. This compound falls within the compounds of section 3 of

claim 4 in the present application. Thus the compound of Application No. 09/806,373 would inherently be ferromagnetic and would inherently exhibit light-filtering characteristics, absent any showing to the contrary. The present application teaches on page 6, lines 11-16, that the addition of n-type and p-type dopant to ZnO will adjust the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. Thus the claimed methods of Application No. 09/806,373 of adding different combinations of n- and p-type dopant, and the fact that any dopant addition will increase the density of the dopant to above zero, will adjust the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. Thus the processes of claims 6 and 7 are suggested by the claims of Application No. 09/806,373.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 4-7 are provisionally rejected under 35 U.S.C. 102(e) as being anticipated by copending Application No. 09/806,373 which has a common inventor with the instant application.

Based upon the earlier effective U.S. filing date of the copending application, it would constitute prior art under 35 U.S.C. 102(e), if patented. This provisional rejection under 35 U.S.C. 102(e) is based upon a presumption of future patenting of the copending application.

Application No. 09/806,373 teaches a ZnO-type compound of ZnO doped with a p-type dopant and at least one n-type dopant. This compound falls within the compounds of section 3 of claim 4 in the present application. Thus the compound of Application No. 09/806,373 would inherently be ferromagnetic and would inherently exhibit light-filtering characteristics, absent any showing to the contrary. The present application teaches on page 6, lines 11-16, that the addition of n-type and p-type dopant to ZnO will adjust the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. Thus the taught methods of Application No. 09/806,373 of adding different combinations of n- and p-type dopant, and the fact that any dopant addition will increase the density of the dopant to above zero, will adjust the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. Thus the processes of claims 6 and 7 are anticipated by the methods of Application No. 09/806,373.

This provisional rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the copending application was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

This rejection may not be overcome by the filing of a terminal disclaimer. See *In re Bartfeld*, 925 F.2d 1450, 17 USPQ2d 1885 (Fed. Cir. 1991).

Claims 4-7 are rejected under 35 U.S.C. 102(a) as being anticipated by WO 00/22202.

Application No. 09/806,373 is the English language equivalent for this reference. Accordingly, this reference teaches a ZnO-type compound of ZnO doped with a p-type dopant and at least one n-type dopant. This compound falls within the compounds of section 3 of claim 4 in the present application. Thus the compound of the reference would inherently be ferromagnetic and would inherently exhibit light-filtering characteristics, absent any showing to the contrary. The present application teaches on page 6, lines 11-16, that the addition of n-type and p-type dopant to ZnO will adjust the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. Thus the taught methods of the reference of adding different combinations of n- and p-type dopant, and the fact that any dopant addition will increase the density of the dopant to above zero, will adjust the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. Thus the processes of claims 6 and 7 are anticipated by the methods of the reference.

Claims 1, 4 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Stoner et al.

This reference teaches a compound having the formula $(Zn_{1-x}Y_x)O$, where x is 0.005-0.16 and Y can be Ni, Cr, Fe or V. These compounds fall within the compounds of claim 1 and sections 1 and 3 of claim 4. Thus the taught compounds would inherently be ferromagnetic and would inherently exhibit light-filtering characteristics, absent any showing to the contrary. The claimed compound reads upon that taught.

Claims 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Minegishi et al

This reference teaches a ZnO-type compound of ZnO doped with a p-type dopant. This compound falls within the compounds of section 3 of claim 4 in the present application. Thus the compound of the reference would inherently be ferromagnetic and would inherently exhibit light-filtering characteristics, absent any showing to the contrary. The present application teaches on page 6, lines 11-16, that the addition of n-type dopant to ZnO will adjust the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. Thus the taught method of the reference of adding a p-type dopant, which will increase the density of the dopant to above zero, will adjust the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. Thus the processes of claims 6 and 7 are anticipated by the method of the reference.

Claims 1, 4 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Nitta et al.

Table 1 of this reference teaches the compounds $Zn_{0.5}Fe_{0.5}O$ and $Zn_{0.5}Ni_{0.5}O$. These compounds fall within the compounds of claim 1 and sections 1 and 3 of claim 4. Thus the taught compounds would inherently be ferromagnetic and would inherently exhibit light-filtering characteristics, absent any showing to the contrary. The claimed compound reads upon that taught.

Claims 1 and 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Hager.

This reference teaches ZnO doped with Ru or Rh and the method for producing these compounds. These compounds fall within the compounds of claim 1 and sections 1 and 3 of claim 4. Thus the taught compounds would inherently be ferromagnetic and would inherently exhibit light-filtering characteristics, absent any showing to the contrary. The present application teaches on page 9, lines 8-19, that the addition of Rh or Ru to ZnO will adjust the ferromagnetic

characteristics, such as the ferromagnetic transition temperature, of ZnO. The taught method of the reference of adding Rh or Ru to ZnO increases the density of the dopant to above zero and thus adjusts the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. The claimed compound and methods read upon that taught.

Claims 1 and 4-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Dausch.

This reference teaches ZnO doped with divalent Fe, Co or Ni and the method for producing these compounds. These compounds fall within the compounds of claim 1 and sections 1 and 3 of claim 4. Thus the taught compounds would inherently be ferromagnetic and would inherently exhibit light-filtering characteristics, absent any showing to the contrary. The present application teaches on page 9, lines 8-19, that the addition of these elements to ZnO will adjust the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. The taught method of the reference of adding Fe, Co or Ni to ZnO increases the density of the dopant to above zero and thus adjusts the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. The claimed compound and methods read upon that taught.

Claims 1 and 3-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyazaki et al.

This reference teaches ZnO doped with 1-10 at% of at least one of Cr, B and Ga and the method for producing these compounds. B and Ga are known n-type dopants. These compounds fall within the compounds of claims 1, 3 and sections 1 and 3 of claim 4. Thus the taught compounds would inherently be ferromagnetic and would inherently exhibit light-filtering characteristics, absent any showing to the contrary. The present application teaches on page 6,

lines 11-16 and page 9, lines 8-19, that the addition of Cr, B or Ga to ZnO will adjust the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. The taught method of the reference of adding Cr, B or Ga to ZnO increases the density of the dopant to above zero and thus adjusts the ferromagnetic characteristics, such as the ferromagnetic transition temperature, of ZnO. The claimed compound and methods read upon that taught.

Claims 1, 2 and 4-10 are rejected under 35 U.S.C. 102(b) as being anticipate by Pfrommer et al.

This reference teaches ZnO doped with at least one divalent metal selected from Fe and Mn. Thus the reference teaches ZnO doped with Fe or Fe and Mn. . These compounds fall within the compounds of claims 1, 2 and sections 1 and 3 of claim 4. Thus the taught compounds would inherently be ferromagnetic and would inherently exhibit light-filtering characteristics, absent any showing to the contrary. The present application teaches on page 9, lines 8-19, that the addition of Fe or Fe and Mn to ZnO will adjust the ferromagnetic characteristics, such as the ferromagnetic transition temperature, the stability of the ferromagnetic state and the light filtering characteristics, of ZnO. The taught method of the reference of crystal-mixing Zn and Fe or Fe and Mn will increase the density of the dopant to above zero and thus adjusts the above ferromagnetic characteristics of ZnO. The claimed compound and methods read upon that taught.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (703) 308-3817. The examiner can normally be reached on Monday-Thursday from 7:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Bell, can be reached at (703) 308-3823.

The fax number for Amendments filed under 37 CFR 1.116 or After Final communications is (703) 872-9311. The fax number for all other official communications is (703) 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661 or (703) 308-0662.

cmk
January 24, 2002

C. Melissa Koslow
Primary Examiner
Tech. Center 1700